

REMARKS

I. Introduction

In response to the pending Office Action, Applicants have amended claims 107 and 108 in order to further clarify the subject matter of the present invention. Support for the amendment to claim 107 may be found, for example, on page 68, line 20 to page 69, line 1 of the specification. Support for the amendment to claim 108 may be found, for example, on page 70, line 7 of the specification. In addition, new claim 109 has been added. Claim 82 was cancelled, without prejudice. No new matter has been added.

A Request for Continued Examination is being filed concurrently herewith.

For the reasons set forth below, Applicants respectfully submit that all pending claims are patentable over the cited prior art.

II. The Rejection Of Claims 107-108 Under 35 U.S.C. § 102 and 103

Claim 107 was rejected under 35 U.S.C. § 103(b) as being unpatentable over Fuller et al. (USP No. 6,068,941) in view of JP 08-293314, over Fuller in view of JP 2003/229156 and over Fuller in view of JP 11-67252. Claim 108 was rejected under 35 U.S.C. § 102(b)/103(a) as being anticipated by or alternatively unpatentable over Dine et al. (US 2002/0098393) and Ueno et al. (US 2001/0001287). Applicants respectfully traverse these rejections for at least the following reasons.

Amended claim 107 recites a method for operating a fuel cell...comprising a step of carrying out a restoring operation including: operating the fuel cell while feeding the oxygen-containing gas to the cathode, and feeding a hydrocarbon gas ... to the cathode instead of the oxygen-containing gas which has been fed to the cathode, to decrease a potential of the cathode.

It is admitted that Fuller fails to disclose feeding a hydrocarbon gas to the cathode. However, it is alleged that references JP 08-293314, JP 2003/229156, and JP 11-67252 each disclose this feature. This allegation is incorrect.

With regard to the JP 08-293314 reference, the Examiner alleges that JP '314 teaches supplying propane to the fuel cell. However, it does not state that propane is supplied to the cathode, as is required in the claim. In fact, the Examiner admits that JP '314 teaches automatic switching to a spare fuel such as propane to stabilize the power supply when the supply of city gas to the fuel cell is interrupted. Thus, the Examiner implicitly admits that JP '314 teaches supplying propane to the anode to continue fuel cell operation, as opposed to supplying propane to the cathode in order to replace oxygen after termination of the fuel cell.

Furthermore, JP 11-67252 discloses that the city gas and steam from waste heat recovery device are mixed, reformed in a reformer 22 and the obtained anode gas containing hydrogen is supplied to an anode A of fuel cell 20. However, in contrast to the pending claim, air is supplied to the cathode in JP 11-67252 (see, Abstract of JP 11-67252). In addition, JP 2003/229156 also discloses that the city gas is fed to an anode (see, Abstract of JP 2003/229156). Accordingly, the combination of Fuller and either of JP 08-293314, JP 2003/229156, and JP 11-67252 all fail to disclose the limitation of claim 107 of feeding a hydrocarbon gas to the cathode.

In order to establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. *In re Royka*, 180 USPQ 580 (CCPA1974). As Fuller and either of JP 08-293314, JP 2003/229156, and JP 11-67252, at a minimum, fail to describe a method for operating a fuel cell...comprising a step of carrying out a restoring operation including: operating the fuel cell while feeding the oxygen-containing gas to

the cathode, and feeding a hydrocarbon gas ... to the cathode instead of the oxygen-containing gas which has been fed to the cathode, to decrease a potential of the cathode, it is submitted Fuller, JP 08-293314, JP 2003/229156, and JP 11-67252, alone or in combination, do not render claim 107 obvious. Accordingly, it is respectfully requested that the § 103 rejection of claim 107 be withdrawn.

Turning to claim 108, amended claim 108 recites, in-part, a method for operating a fuel cell comprising the step of feeding water to the cathode to decrease a potential of the cathode from a potential in operation to +0.1 V to +0.4 V with respect to a potential of the anode such that the water is poured through the gas flow path for feeding and discharging the oxygen-containing gas to the cathode, after terminating feeding of the oxygen-containing gas to the cathode.

It is alleged that Dine discloses that upon uncontrolled shut down of a fuel cell, some residual hydrogen from the anode diffuses across the PEM to react with oxygen on the catalyst to form water on the cathode. In contrast, amended claim 108 recites the step of pouring water through the gas flow path of the cathode to discharge the oxygen-containing gas after termination of the feeding of the oxygen-containing gas to the cathode. As it is clear that Dine does not disclose the addition of water by pouring it through the gas flow path, it is clear that Dine fails to disclose each limitation of claim 108.

With regard to Ueno, it is alleged that water is supplied to the surface of the cathode, when the fuel cell system is stopped. However, the water is merely supplied after termination of the fuel cell because it is shut off after the supply of the fuel gas in the normal termination of the

cell. As such, in Ueno, water is supplied to the cathode only when a normal voltage is output during operation and the voltage is maintained.

As is shown in Fig. 6 of Ueno, in step S31, output voltage is connected from stack 2 to motor 77 (see, L2 to L4 in paragraph [0051]). In step S61, stack 2 is disconnected from motor 77. In steps S43 to S45 and S49 to S51, all of which are between steps S31 and S61, pump 61 supplies water from nozzle 55 to the cathode (see, paragraph [0056]). In contrast to Ueno, the cathode potential of the restoring operation recited in amended claim 108 (+0.1V to +0.4V) is significantly different than the normal operation potential of +0.75V (see, page 65, lines 16-17 of the specification). As such, it is clear that in Ueno, the water is fed to the cathode under normal operations and as such, will not give the potential of claim 108. As such, Ueno fails to disclose the limitation of feeding water to the cathode to decrease a potential of the cathode from a potential in operation to + 0.1 V to + 0.4 V with respect to a potential of the anode.

Furthermore, in Ueno, water is not fed to the cathode after termination of normal operation. As is shown in Fig. 7 of Ueno, the pump for supplying water is turned off at the end of the stop operation (see, step S65). However, in Fig. 5, the flowchart shows a start operation and Fig. 6 shows normal operation wherein the pump 61 is turned on, thereafter the pump is turned off after every ON operation (steps S43 to S45 and S49 to S51). After the final ON operation, there is a transition to the stop operation in Fig. 7 without having another start operation. In other words, the pump has been turned off and is no longer supplying water during operation BEFORE the stop control operation begins in step S61. As such, water is not being supplied to the cathode after termination of normal operation. Accordingly, Ueno does not teach the step of feeding water to the cathode after terminating feeding of the oxygen-containing gas to the cathode.

Anticipation under 35 U.S.C. § 102 requires that each element of the claim in issue be found, either expressly described or under principles of inherency, in a single prior art reference, *Kalman v. Kimberly-Clark Corp.*, 713 F.2d 760, 218 USPQ 781 (Fed. Cir. 1983), and in order to establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. *In re Royka*, 180 USPQ 580 (CCPA1974). At a minimum, Ueno and Dine do not disclose a method for operating a fuel cell comprising the step of feeding water to the cathode to decrease a potential of the cathode from a potential in operation to + 0.1 V to + 0.4 V with respect to a potential of the anode such that the water is poured through the gas flow path for feeding and discharging the oxygen-containing gas to the cathode, after terminating feeding of the oxygen-containing gas to the cathode. As such, it is clear that Ueno and Dine, alone or in combination, do not anticipate, nor render obvious, claim 108 of the present invention.

Furthermore, as claim 109 is dependent upon claim 108, which is allowable for the reasons set forth above, Applicants submit that claim 109 is allowable over the cited prior art.

III. Conclusion

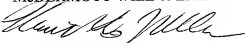
Having fully responded to all matters raised in the Office Action, Applicants submit that all claims are in condition for allowance, an indication of which is respectfully solicited.

Application No.: 10/696,505

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 500417 and please credit any excess fees to such deposit account.

Respectfully submitted,

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